



LECTURE

8

INTRODUCTORY TO THE COURSE

OF

JEFFERSON MEDICAL COLLEGE

FOR THE

SESSION OF 1874-75.

DELIVERED OCTOBER 5, 1874.

BY

WM. H. PANCOAST, M.D.,

PROFESSOR OF GENERAL, DESCRIPTIVE, AND SURGICAL ANATOMY.

PUBLISHED BY THE CLASS.

PHILADELPHIA:

P. MADEIRA, SURGICAL INSTRUMENT MAKER,
115 SOUTH TENTH STREET, BELOW CHESTNUT.

1874.

ACTION OF THE CLASS.

AT the close of the Introductory Lecture delivered by Prof. WM. H. PANCOAST, before the large audience had separated. Mr. J. D. DAVIS, who had been chosen as the orator of the Class for the occasion, presented to the professor, a beautiful floral token, as an evidence of the esteem felt for him by the students of the preceding years, who had attended his lectures on anatomy in the college. The orator, in a neat address, alluded with much feeling to the services rendered by the Emeritus Professor of Anatomy to the College, during the long period of thirty-six years, and warmly expressed the attachment of the numerous students, who had listened to his instructions during that time. Thanking the Honorable Board of Trustees of the College, for the choice they had made in electing his son to succeed him, who had co-operated with his father for twelve years in the teaching of anatomy in the school, and had given such thorough satisfaction to the students, that they hailed his election with joy. They anticipated with the greatest pleasure, the continuance of the method of teaching which had made the Chair of Anatomy in the school so distinguished, and which had received the warm approbation of the many previous classes of Jefferson Medical College. In conclusion, the orator congratulated the friends of the College upon the result of the election, as it secured for its future honor and success the united services of the Emeritus Professor, with those of the present Professor of Anatomy. To the latter they wished many years of continued distinction and usefulness, and heartily welcomed him to his professorial duties.

By order of Committee.

THOMAS L. WHITE, *Chairman.*

CORRESPONDENCE.

JEFFERSON MEDICAL COLLEGE,

Wednesday, October 7, 1874.

At a meeting held by the Students of the Jefferson Medical College this day, it was unanimously—

Resolved, That a Committee be appointed, consisting of representatives from each State, Province, and Nationality, to wait upon Prof. WILLIAM H. PANCOAST, tender him the compliments of the Class, and solicit a copy of the Introductory Address delivered by him on Monday evening last for publication.

JOS. S. NEFF, PA., *President*.

W. M. BRINTON, PA., *Secretary*.

Prof. PANCOAST—

DEAR SIR: It is with great pleasure that we, the Committee, perform the duty assigned us in the above Resolution, and hope that you will accede to the unanimous request of the Students, for a copy of your most interesting address. Permit us, also, to express the hope, that many years of usefulness and honor, await you in your new career, which has thus been so auspiciously begun.

THOS. L. WHITE, Pennsylvania.	C. D. McDONALD, Georgia.
H. E. MUSSER, “	T. E. POTTER, Missouri.
J. W. POPE, “	W. H. BALDWIN, California.
D. M. APPEL, “	T. A. CROWELL, North Carolina.
P. C. HOSKINS, “	S. A. CHURCHILL, Iowa.
W. W. HOUSEMAN, “	H. L. BRIGGS, Maine.
H. M. BLACK, “	WM. COE, Massachusetts.
T. B. HORWITZ, “	A. G. MAHON, Virginia.
W. H. BORLAND, “	D. A. MITCHELL, Wisconsin.
WM. MCFADDEN, JR., “	G. H. J. HART, Louisiana.
GEO. M. KELLY, “	R. J. HILL, Minnesota.
J. F. DUNLAP, “	LOUIS BAZET, Michigan.
W. L. DARLINGTON, “	J. E. CHAMBERS, Indiana.
J. D. DAVIS, “	J. L. GASKINS, Florida.
J. SIBBALD, “	GUILLERMO M. PLANA, Cuba.
WM. MOFFET, “	EBEN H. BENNETT, Nova Scotia.
E. L. JOHNSTON, Ohio.	DIXON C. ALLEN, New Brunswick.
A. C. HOSS, Tennessee.	J. B. M. BONNEFIL, Costa Rica.
J. E. SMITH, New York.	J. S. WOODSIDE, India.
DAVID BLEY, Illinois.	CHAS. M. THOMPSON, England.
GEO. C. LIPPINCOTT, New Jersey.	MAX URNITZ, Germany.
C. A. GROFF, Maryland.	L. S. GORIBAR, Mexico.
WM. F. HEARN, Delaware.	ALPHONSE C. PRITCHET, France.
H. D. HEINITSH, South Carolina.	R. H. MCCARTY, A.M., M.D., D. C.
B. C. PRATHER, JR., Kentucky.	ANTONIO GOICOURIA, M.D., P. Rico.
W. J. BOYDSTON, W. Virginia.	W. J. DAWSON, Central America.
C. C. RANDLE, Mississippi.	

GENTLEMEN:—

I have the honor to acknowledge the receipt of your very complimentary communication of the 7th inst., requesting a copy of my Inaugural Address for publication. I feel that I must comply with the desire of the Class so kindly expressed, and therefore place it at your disposal.

Pray accept for yourselves, and the gentlemen you represent, the expression of my earnest wish for your future happiness and prosperity.

Very sincerely your friend,

WM. H. PANCOAST.

1100 Walnut Street, October 9, 1874.

To Messrs. T. L. WHITE, H. E. MUSSER, J. W. POPE, D. M. APPEL,
and others, Committee of the Class.



INTRODUCTORY LECTURE.

GENTLEMEN: My colleagues have deputed to me, as their representative, the agreeable duty of greeting you this evening, and of inaugurating the present course of lectures, the fiftieth, in Jefferson Medical College.

This may be called the semicentennial anniversary of our school.

Man's life is limited to years; yet he celebrates their annual return.

An institution of learning exists for generations, and may well measure its existence by the half-century. A nation gauges her growth by centuries, and demands the honors of a centennial. Our own well-loved country, will soon bring before the world's jury, the evidences of the greatness she has achieved within a hundred years. In a gigantic palace now in the process of construction, she will exhibit the products of her skill, and the evidences of her exhaustless wealth in soil and mine, side by side with those of all the nations of the earth. But there are some things which she cannot exhibit—the growth of institutions like this—without government support, founded, fostered, and sustained by Americans; which in the short period of fifty years, has grown into such prosperity and renown, as, at least, to fully rank with any other institution in the land.

The portion in the allotment of its varied duties, assigned me by the Honorable Board of Trustees of the College, is that of endeavoring to make you familiar with the structure of the human frame—of the growth and constitution of those very organs—by which we live and move, and have our being.

The science of Anatomy may be deemed, historically, the oldest of all the departments of medicine. It has always been considered the only solid basis upon which a sound medical education can be built and sustained. Yet with all its acknowledged antiquity and unquestioned importance, no one has been able, in the deep obscurity of the past, to assign a positive point of time for its origin. In the attempt to do so, we find ourselves involved in mist and obscurity. It is like tracing back the dawning day into the night, from out of which it breaks. Yet the thinking mind at the earliest age of the world, must

surely have formed some idea to itself, of the structure of the casket in which it had its habitation.

The preparation of animals for the table; even the rude process of embalming as practised by the Egyptians, and the inspection of casual wounds, would have furnished some knowledge in regard to the subject of animal structure. Indeed, in ancient Hindoo and Sanscrit literature evidences have recently been evoked, of the existence of considerable anatomical knowledge at that early period, from which, probably, the medical sages of Greece drew much of their inspiration. The first display of anatomical knowledge in the Hellenic period, is found in the writings of the blind poet of "Scio's rocky isle." Homer not only shows considerable anatomical knowledge, but has been considered amenable to the charge, of exhibiting some vanity in its display. The wounds which he makes one of his heroes inflict upon another, seem designed for the purpose of bringing his anatomical knowledge into conspicuous place. The stone which Diomed threw at Æneas, not only broke the bone of the thigh, but tore the ligaments of the acetabulum. Merion was wounded in one of the large veins which returned the blood to the heart, and Ulysses meditated to strike the Cyclops, just where the liver adhered to the diaphragm. This greatest, as well as the most ancient of poets, had a high appreciation of the value of medical science, for he makes Idomeneus, when wounded, say to Nestor—

"Ascend thy chariot, haste with speed away,
And great Machaon to the ships convey:
A wise Physician, skilled our wounds to heal,
Is more than armies to the public weal."

No great advance in the science of medicine was made until the time of the great Hippocrates, the second of that name, who was born in the first year of the 80th Olympiad, according to the various computations, 460 to 370 years before the Christian era. His works were so highly prized, that they continued to be regarded with the greatest veneration, during a period of more than two thousand years, and are still highly estimated in most portions of the world. Hippocrates, however, with all his enthusiasm in the pursuit of knowledge, and his wonderful powers of observation, and exact description of such forms of disease as came under his view, possessed but a very imperfect knowledge of anatomy. He gleaned something of it from the school of Pythagoras, but he believed to the last, that the arteries were filled with an aerial fluid, not blood, and had scarcely any knowledge of the nervous system. Plato and Aristotle, who were the greatest of his successors, added much to anatomical science, by

a systematic dissection of the inferior animals. In this respect Aristotle, through the imperial magnificence of Alexander the Great, enjoyed extraordinary advantages, for the whole civilized world of that day, was made to contribute animals of various climes, to the service of his knife. The treatise he prepared on anatomy, was, however, unhappily lost, and we know not exactly now, how far the researches of that wonderful observer, had been carried, or how great has been our loss.

The Greeks, like the Jews and Egyptians, looked with such *insurmountable* horror on the idea of human dissection, that it was not until this pursuit was legally authorized by Ptolemy Soter, brother-in-law of Alexander, that the true science of human anatomy had its origin. In the mean time, a great amount of knowledge, gleaned, it is true, too much from the study of the inferior animals, had been added, and was continually being added to, by a multitude of observers, whose names and works we have not time to mention. One great genius made some important discovery of structure. This he gave to his disciples. They would spread that knowledge from place to place, as far as it could go. Then another, and another, going further with a little deeper insight into the subject, would add some new facts to the preceding ones, or sometimes overthrow them entirely. In this way science of every sort seems to have had its origin, and growth. All true facts of discovery, whatever they may overthrow, are assimilative and naturally unite, and so form a body of doctrines. It is interesting also to observe, how near some of these greatly distinguished men approached, without solving the great marvels, which startled a succeeding age—as the circulation of the blood, and the functions of the nervous system. We now enjoy the rich treasures of anatomical knowledge, that the scientists of all ages have slowly and laboriously piled up. The unthinking might be tempted at this present time, to smile when they learn, how slow, doubtful, and halting were the first steps of discovery, into the unknown structures of the human body. These slow steps, however they were made, were the results of the efforts of men of extraordinary capacity, of unbounded industry, often the favorites of kings, and of such insatiable ardor that they sought, when necessary, the obscurity of crypts and groves, for the furtherance of researches, which an ignorant world deemed unhallowed. It is in this way that all knowledge is gathered. Faltering and feeble and imprecise, at first, it grows up towards perfection, in the midst of doubts and difficulties, until, at the end, it is wrought out into the glorious effulgence of noonday clearness. Such will be your own experience, during your novitiate in these halls. You

will go on attacking the difficulties in your way, often doubtfully, sometimes, it may be, despairingly, yet advancing step by step, climbing upwards, ever upwards in the path of science.

The Library and Museum of Alexandria were founded by Ptolemy Soter, who also established the Alexandrian School. The Library he placed under the charge of Aristotle.* The system of instruction in the school was divided into the four faculties of Literature, Mathematics, Astronomy, and Medicine. The medical faculty were Cleombrotus, of Cos; Herophilus, and Erasistratus. In that school Herophilus, of Chaleedon, taught anatomy, and, together with his contemporary, Erasistratus, the grandson of Aristotle, made clear much of human anatomy. The name of Herophilus remains enshrined in our science. The Torcular Herophili, the meeting place of the tortuous venous sinuses of the dura mater, is thus named in his honor as the discoverer. He was the first to teach anatomy from the human skeleton. Aristotle had described the brain as divided into halves, with a cavity in the centre, and a smaller brain at the back of the head. Herophilus pointed out the four great cavities, and described the cerebral nerves with considerable precision; traced the delicate arachnoid membrane, and was the first to discover the vessels which carry the chyle from the intestines, though he knew not their use.† He characterized the veins and the arteries by the thickness of their coats. He was the first Greek physician who wrote an accurate treatise on the pulse, and tells us, strange to say, that to comprehend it, it is necessary to be first acquainted with geometry and music. Erasistratus advanced much the knowledge of the structure of the brain; showed that its cavities, or ventricles, communicated; recognized the valves of the heart; traced more carefully the nerves, which he recognized as the organs of sense and motion; discovered that the stomach was the organ of digestion, and that blood was sent to the liver for the purpose of forming bile. It is said that to both these anatomists the bodies of malefactors were appropriated for dissection. It is charged against Herophilus that, in his unrestrained enthusiasm, he sometimes opened the bodies of living criminals, to discover the secret springs of life. At this great Alexandrian epoch, though there were many laborers whose great names we

* Dr. Meryon, *History of Medicine*, vol. i. p. 33; Robley Dunglison, M.D., LL.D., etc., *History of Medicine*, p. 136. "Aristotle was placed in charge of the Temple of Serapis, which, it is said, contained from five hundred thousand to seven hundred thousand books."

† Dr. Meryon, *History of Medicine*, vol. i. p. 35.

have not time to dwell on, but a small portion, however, of the great discoveries in anatomy were made.

From some unknown causes the practice of human dissection fell into disuse at Alexandria, and, in consequence, but little advance was made in the science of anatomy for three centuries. At the lapse of this time the world was blessed by the appearance of an extraordinary man, Galen of Pergamos, while Adrian was Emperor of Rome. He subsequently became a citizen of that capital of the world. Born to rank and fortune, familiar with all the learning of his time, Galen devoted his attention to physic, which he pursued in all its varied branches with passionate and unwavering industry. In order to see and study a human skeleton, he crossed the midland sea to Alexandria, in which great centre he prosecuted his studies. The practice of human dissection not then being permitted, he was obliged to resort to the dissection of animals nearest man in their organization, and occasionally of opening them alive in order to understand better the functions of the interior organs. The ape appears to have been his principal subject for dissection, and he compared its structure most carefully with that of other beasts, birds, and fishes. Yet still he was able to give a better and more methodical description than was ever before made, of the bones, muscles, ligaments, vessels, and nerves. He was the first to prove that *arteries* carried blood and not air. He pointed out the principal features of the pulmonary circulation, described the peculiarities of the foetal heart, and proved that the larynx was the organ of voice. His chapters on Physiology, which he calls the uses of parts, are indeed, for the time in which they are written, a marvellous production. He attempts to prove from the framework of the human body, the wisdom, power, and goodness of the Creator, in opposition to the philosophy of Epicurus, which then prevailed. This heathen, this great and learned philosopher, gives utterance to his feelings in a hymn to the Creator, which approaches, in sublimity and pathos, Thomson's beautiful peroration at the end of his "Seasons." Imperfect as were his works, they were written with such rare scholastic ability, and were still so much in advance of all that had previously been taught, that for many centuries they were looked upon with such awe and veneration, that it was considered almost a crime to question their authority. Even in the sixteenth century of our era, Massaria, a professor of Pavia, absolutely declared that he would rather err with Galen, than be right with any other physician. After a long Galenic rule, came the barbaric overthrow of the Roman Empire, and, the lamp of science overturned, seemed almost extinguished. The School of Alexandria

was finally crushed beneath the feet of its Arab conquerors, and its great library of 800,000* volumes, the depository of the learning and science of the world, given to the flames, under the cry of Caliph Omar—"If these books contain only what is in the Koran, they are useless; if more, they must be burned." But happily some benevolent Arab, more wise than the Caliph or his companions, from these flames rescued the works of Galen. They were translated into the Arabic, and preserved with a veneration so great, as to preclude any emendation. This sufficed to keep them in existence, to prevent the lamp of science from being utterly extinguished, when the works of Galen had been forgotten at the courts of Rome and Constantinople. The western world was then passing through a cloud of intellectual darkness. The Greeks, with whom civilization yet lingered, were sadly degenerated from those sages who graced the classic age, and had sunk into the slough of despotism, superstition, and ignorance. Much, then, do we owe to the learned Arab physicians and surgeons, for Galen was only again introduced to Europe through a translation from the Arabic. Not the least of our obligation to them is the foundation of the first proper medical school in Europe, that of the ancient University of Salerno. In the eleventh century of our era much curiosity was engendered respecting Oriental learning, especially in regard to medicine. Some enthusiastic and enterprising spirits, sought in the East, the information they could not obtain in the West. A band of forty Norman pilgrims, returning from such an expedition, landed at Salerno, in Italy, near Naples, where some sort of a school of medicine had been established, as early as the seventh century by the Benedictine monks, for the purpose of teaching the art. These pilgrims imparted a more scientific character to the school, whose growth had been so stunted by the superstitions of the times, as to have greatly lessened its importance.

This was the first school, in which regular medical diplomas, were granted to candidates for medical honors, after an examination into their qualifications. The school of Salerno continued to flourish until the fourteenth century, and so great was its reputation, that many royal individuals studied medicine there; but it gradually declined without leaving any great monument to our science. The site of this historic school, was an object of deep interest to me, in a visit I paid some years ago to Salernum. But I sought for it in vain. The most that I could learn was, that its renowned site, was yet marked by some moss-grown stones up in the woods, a mile from the

* Dr. Meryon, vol. i. p. 120.

town. It is at the end of a valley, withdrawn from one of the beautiful crescentic sweeps, so common in the Mediterranean Sea.

Nearly a thousand years had passed, before any important improvement was added to the anatomy of Galen. In the course of the fourteenth century, many bright intellects began to test by their own dissections, and to correct the works of Galen. Mundinus, of Milan, may be considered the father of modern anatomy. He revived the *practical* study of anatomy from dissections, and in 1315, dissected the human subject in the presence of his pupils at Bologna; the first demonstration of this scientific character, that had taken place for many centuries. Soon, other universities followed the leading of Bologna, though the dissections were made unskillfully. These were entrusted to a barber's apprentice, who, with no more elegant instrument than a razor, prepared the material for the lecture. The Professor then, with the treatise of Mundinus in his hand, read the description of the parts, pointing them out to his admiring students, who stood respectfully around, watching his demonstration with awe.

Berengarius of Carpi, Stephens of Great Britain, and others, followed the brilliant example of Mundinus. But a young man of Belgium—learned, ardent, and of indefatigable industry—Andrew Vesalius by name, was the first to break completely the spell, with which the name of Galen had bound the world. He had such a thirst for anatomical knowledge, that to satisfy it, in a time when the study was involved in much danger, he robbed the gibbets of their horrid burdens, and dissected the bodies in the secrecy of his bed chamber. He soon discovered that much of Galen's anatomy, had been taken from quadrupeds; and published a work occupying three years in its preparation, which Titian, the great painter, loaned his genius to adorn, and which may well be esteemed even now, from its accuracy and method, a valuable addition to any medical library.

At the beginning of the seventeenth century, followed the complete discovery of the circulation of the blood, by the English Harvey—who, in the year 1619, demonstrated to his pupils the general mechanism of the circulation. This discovery struck the scientific world with amazement, and even alarm. The truth of this greatest of scientific discoveries, was resisted for a time with much violence, but by degrees it became established, and marked a revolution in anatomical science. Not that Harvey himself, alone and unaided, wielded the spear of Ithuriel. The coming of great events, seems always to be foreshadowed. I have alluded to some earlier anatomists, who, in their time, had already obtained considerable insight into the structure of the heart, and the pulmonary circulation.

Fabricius of Aquapendente, had taken up the subject with great enthusiasm. He opened up all the veins of the body, and described carefully the form, situation, and structure of the valves. He was not able, however, to grasp the great secret of the circulation. He taught at Padua. The very anatomical theatre in which he lectured, is yet standing unchanged. It is a small funnel-shaped chamber, with high circular walls, on the inside of which there is a smooth spiral staircase to the top, along which the students placed themselves standing, as they looked down upon the novel demonstrations of the distinguished teacher. To this school came the young Harvey, and in the adjoining hall hang his armorial bearings, among those of other noble, and worthy students of the University of Padua, whose names have been thus preserved to fame, for learning then was an honor. I have stood on that winding stair, where Harvey stood, and as I looked down upon the table below, I have tried to conjure up his brooding fancies, as looking along the course of the opened veins, he began to work out a complete view of the circulation, by adding to the venous, the torrent of the arterial circuit. On returning to England, he resumed with enthusiasm the study of the circulation. He is said to have opened animals alive, in order to determine more accurately, the uses of the valves. Finally, he dissected out the main trunks of the arteries and veins entire, and arranged them on a large blackboard, so as to make completely manifest to the eye, the true nature of the circulation. I have seen such a preparation, made it is said by his own hand, in the museum of the Royal College of Physicians and Surgeons in London, where it is preserved as a simple, but precious relic. Soon after the establishment of Harvey's theory of the circulation, the vessels which carry merely the white fluids of the body—the lacteals and lymphatics—were made known more completely to science, by the labors of some able dissectors, Asselius of Pavia, Rudbeck a Swede, Bartholinus a Dane, Pecquet of France, Dr. Monro and Mr. Hewson of Great Britain—the last the grandfather of a distinguished alumnus of our school; but ultimately—in 1787—this important system was demonstrated by Mascagni, who was the first to give us a general description, of the entire lymphatic apparatus.

About the middle of the sixteenth century, the microscope which had for some time been used, was improved and brought more fully into use, and was found to be a great acquisition, in the study of anatomy. To the instrument of that day, we are indebted for many important discoveries in the minute structure of the parts—made by such men as Malpighi, Swammerdam, and Leeuwenhoek. In this way, and from a great variety of sources, that the hour this evening will

not give me time to mention, contributions were continually being added, to the growth of the great science of anatomy. The structure of every organ, was thus pretty thoroughly studied and described. With this then must I content myself in this lecture, as a brief sketch of the rise and progress of anatomy, as a science.

It may next be interesting and even necessary for us to see to what beneficial uses a knowledge thus laboriously acquired by the work of centuries, and so carefully stored up, has been applied. From even this very brief sketch that I have given, of the rise and progress of anatomy, it would seem clearly impossible for the many brilliant anatomists that I have referred to, as they revealed the structure of the different organs, to fail to speculate in regard to their uses and functions. We have seen how well this was done, even in the time of Galen. Anatomy of necessity had to precede physiology. Without a knowledge of the position, shape, and structure of the organs, what could we know of their uses? Physiology, is the science of the organs in action. As was the case with anatomy, crude enough were the ideas entertained, in regard to the science of physiology at its outset. It has only made legitimate advance, with the rising progress of anatomy. Though it is now a science, rich, full, and beautiful; physiology may yet be said to be susceptible of a further advance, which must wait on that of anatomy—an advance that we hope will be made, by the aid of improved modern means of investigation. For we now have the use of the beautifully perfected microscope of the present day to aid us, and the wonderful resources of organic chemistry.

Parallel likewise with the growth of anatomy, and also dependent upon it, arose another branch of medical science, that of pathological anatomy. As the old anatomists made themselves more and more familiar, with the structure of the different parts of the body, they could not fail to have been struck with the alterations in the form and structure of parts, that disease had produced. These structural changes were at first noticed rather as curiosities. In the course of time, however, we find them collected, as in the works of Vesalius and Varolius, so as to force the attention of observers. They were then induced to arrange them in natural groups. Each morbid change in the organs, was compared with the natural structure of the part, which it had transformed or replaced. Thus was arranged a collection of methodized facts, which attracted great attention. This was the birth of pathological anatomy. It gave a clear insight into the nature of diseases, in opposition to theory and speculation, and in this way the mind of the profession was fixed at an early day, on the positive facts connected with morbid processes. Among those who were its great

exponents, we may mention Bonetus and Morgagni, Lieutaud and Baillie. It soon became a great aid to practitioners in facilitating the comprehension of the nature of disease. It was, however, far short of what was wanted. It was a record of the after results—of the slow undermining changes in chronic maladies, or of the whirlwind like destruction of an apoplectic seizure, or a ruptured aorta. Between the origin of the evil, and its final devastating results, there was a record yet to be written—a record the most important of all—such a one as would make manifest, the gradual changes that disease was making, and thus arouse the physician to apply measures likely to arrest its course. A mistake had been made, a mistake from which some even yet find it difficult to free themselves—that the morbid change is the disease itself; whereas, it is simply like the “caput mortuum” of the chemist, something left behind—the after-wrecks of the storm.

A still further advance in our science was required, in order to admit of that useful and brilliant expansion, which has been given to the advanced physiology and pathology of the present century; for, as yet, pathological anatomy was like the special and descriptive anatomy of olden times, an individual record mainly, of what was seen in various localities. It was found that there were special tissues, which had relations in structure and sympathy, healthy and diseased, throughout the distant portions of the whole economy, such as exists between the serous membranes of the heart and the articulations, which no nervous connection would suffice to explain. We wanted indeed a general anatomy of the tissues, as they are spread through the economy; a new and more comprehensive physiology and pathology based upon the tissues, both in the condition of health and that of disease. The wonderful work of Xavier Bichat, which appeared at the beginning of the present century, supplied this want. It was a sort of revelation, and worked at once a revolution in the science. He showed how the twenty-one general tissues of the body, the cellular, the vascular, nervous, serous, bony, etc., while yet separate and distinct in structure and individual sympathies, were woven up together, like the warp and woof of the weaver, to form the different parts of the human body. His penetrative genius had even, at this early day, discovered the great importance of contrasting throughout the body, the healthy with the morbid structures, of the different general tissues. But death came too soon to this brilliant being, to enable him to carry out his grand conception. He died at about the age of 31 years. His memory was beautifully honored in 1857, by the erection in the Place de l'École de Médecine at Paris (an historic

spot), of a statue to his memory. According to my recollection, it was scarcely colossal, but placed on high upon a pedestal, so that all could see the figure, dressed in the style of his period. The marble showed clear cut features of firm, but benevolent expression, crowned by a wonderfully intellectual brow. As I stood in the Place de l'École, in a quiet corner, I saw before me the representatives of the learning and dignity of France, under the Second Empire, some of them in their robes of office—such men as Velpeau, Civiale, Nélaton, Chassaignac, Malgaigne, Ricord, Maisonneuve, Guérin, and Dolbeau. While I listened to the eloquent address of Baron Larry, son of that great military surgeon of Napoleon the First, the eloquent words used by Corvisart in announcing the death of Bichat to the first consul, seemed to flash out, bright and clear,—“Bichat has just died upon a field of battle that numbers more than one victim. No one in so little time, has done so many things, and so well.” What he did, however, in that respect, opened the way, and gave an impulse in a new direction, in which Corvisart, Laennec, and Cruveilhier who died but the other day, soon laid down the basis of modern pathology, in which diseases are grouped with the organs and tissues they affect. Yet this was but the first step of the undertaking, a stage in which the investigations were made mainly with the scalpel and forceps.

The science yet wanted, that thorough minute knowledge of the structure of the individual tissues, which we now call histology. An extraordinary improvement in the construction of microscopes of immense power, occurred consentaneously with this want, and fulfilled it. A multitude of able observers have devoted themselves to this comparatively new department of the science. The improvement of the microscope has still gone on increasing, with the need for its use, enlarging every minute portion of the structure of the human body to almost an incredible degree, say with the best instruments to about 1000 times its natural diameter, until we have now laid before us for consideration, a huge mass of histology, or microscopical observations in anatomy, healthy and diseased; immensely interesting and highly valuable, though perhaps not always to be considered perfectly reliable and settled. It was not a presumptuous, but it was certainly an ambitious undertaking, thus to explore the minute structure of the human body, in this mysterious state of artificial expansion. Do you realize exactly how great is this expansion? Take only the moderate power of two hundred and fifty diameters, which, as applied to various parts in succession, we may consider as applied to the whole. You thus, as it were, have the human form, say six feet in height, expanded into a monster of the imagination, fifteen hundred feet high,

and with a breadth of corresponding proportion. Into this colossal spectre the microscope peers, and makes those wonderful revelations with which you will soon become familiar, through the beautiful demonstrations of my distinguished colleague, the Professor of the Institutes. That the microscope sometimes makes mistakes, need not be deemed surprising. In such a magnified bulk there will be holes and crannies, into which the eye of the observer, even thus assisted, cannot see clearly. There will also necessarily be elevated angles, that will cast deceiving shadows. I think, therefore, that the wise and the prudent, while they embrace with delight the undoubted revelations of the microscope, will hold themselves on guard against the chance of illusions.

The laborers in this great field are too numerous for me to mention in this brief lecture, but I feel as if I must notice a few distinguished names, partly because I have had the honor of knowing some of them personally and have listened to their instruction, and partly because such brilliant examples should stir the pulses of the heart, and incite us all to effort. I would mention Henle, Rokitansky, and Virchow, of Germany; Robin, Lebert, and Follin, of France; Bennet and the illustrious Paget of Great Britain.

But the microscope even now, far as its investigations have been pushed, has not performed its final work. There is yet at least one question for it to determine, whether the morbid products, such as tubercle or cancer, are heterologous in their character—that is, something new of a destructive nature, added to the economy; or merely the ordinary structure, such as it will be my province to show you, not warmed with the ordinary healthy and temperate vital force working in harmony with other parts of the body, but breaking out into a spontaneous morbid activity of development, hostile to the laws of health, and destructive to the organism. But this is one of the questions, that I must leave to older and more able hands.

Now, gentlemen, let us consider, what is the best method of teaching the branch in which it is my duty to instruct you, in order that I may be most useful to those who will honor me with their attention? Shall I coldly teach it, as was done in former times, with all the arid and wearisome iteration you find in works of mere descriptive anatomy? Shall I leave you to get such knowledge of it as you best can, through hard work and taxed memories, and leave you to find out hereafter how you can best apply it to your future needs, as physicians and surgeons? From what I have already said, gentlemen, it may be inferred that I deem a thorough knowledge of anatomy, as important to the physician, as to the surgeon. It would be well for us, who

propose to practise the healing art, if we could get such masterly knowledge of human anatomy, that the body should appear to us as transparent as crystal. Does the idea of such perfection in anatomical study appear to you Utopian? It is not entirely so. Its attainment to a very considerable degree is possible to every one of you, if you but devote yourselves to it, with the zeal and interest becoming a great undertaking. You may say that there are grand anatomists, who are neither good physicians, nor expert surgeons. That may be; for everything is not taught in our books of science, nor from our chairs, that may contribute to the success of the practitioner. There is always much, that he must learn himself in the way of application of knowledge, to make his services prompt and effective. He ought not to rely on luck, chance, or any happy contingencies, for advance in his profession; for there is nothing to be thoroughly relied on, but being well grounded in all the cardinal studies of our science. Whatever new facts you learn from my chair, learn also at the same time, if you can, how you may best apply them to your future needs. One may be well informed in descriptive anatomy, may have memorized completely, the description of every separate vessel, nerve, and muscle; see them all even, stretched clearly before him in the map of his brain, and yet possess but little useful knowledge of the relation of parts, that he can properly apply to aid his suffering fellow-beings. It is my earnest desire to so teach you anatomy, with its various applications to your future wants, as to make it at the same time, both interesting and instructive, and that you and I shall work in real earnest. This method of teaching the great branch of science has been attracting greater and greater attention all over the world, for at least the last forty years. It may almost be said to have had its birth in our school, and at the hands of my predecessors. It was a want felt at a much earlier day, as manifested by old Riolanus. It was apparent in the mode of instruction, of perhaps the most interesting teacher of anatomy, to whom I listened in Europe, the celebrated Hyrtl of Vienna, who, on retiring from his chair, has given us a precious legacy, the complement of all his labors, in his manual of topographical, medical, and surgical anatomy. This method of teaching anatomy, in the best way to serve the wants of the practitioner, has now rapidly grown into favor, and I am sure that I venture but little in saying, that but few lustrums will have passed their rounds, before its merits will be universally acknowledged. It is in this school that I have been brought up, and it is the characteristic of the teaching of my able predecessors in this chair.

In this connection, it may not be deemed inappropriate to give a

few minutes' consideration, to the merits of the distinguished anatomists, to whom our school owes so much.

The first Anatomical Professor in this College was Nathan Reyno Smith. He was born in New Hampshire in 1797, and took his Degree of Medicine in 1823, under the instruction of his father, who was one of the most distinguished surgeons of his time. Shortly after, he was appointed Professor of Surgery and Anatomy in the University of Vermont, and organized the medical school of that institution.

Anxious, says his biographer, to extend his professional knowledge, Professor Smith spent the winter of 1825 in Philadelphia, attending medical lectures. He here made the acquaintance of Dr. George McClellan, who was already distinguished as a zealous and able teacher of anatomy and surgery. Dr. McClellan was then engaged with other prominent members of the profession, in organizing the Medical Department of Jefferson College. At their request, Prof. Smith accepted the position of Professor of Anatomy in the nascent institution, the duties of which chair he ably filled for the succeeding two years. In 1827 he was appointed to the Professorship of Surgery in the University of Maryland, which had just been vacated by the resignation of Prof. Granville Sharpe Pattison.* This post Dr. Smith continued to occupy, until his voluntary resignation of it in 1872. In all these intervening years, illustrated by rich and varied services, as lecturer from his chair, as clinical surgeon in the Baltimore Infirmary, and as private practitioner, he won for himself the well-deserved reputation, of being one of the best surgeons of this or any country. Honored and esteemed by all who know him, this Nestor of Surgery yet holds his matured experience, his rich and ripened acquirements, responsive to the call of the sick and suffering.

Among the many things for which we hold ourselves his debtors, may be mentioned his ingenious method of operating for lithotomy, which he gave to the profession just after leaving Philadelphia, and his anterior suspensory splint, for treatment of fractures of the leg.

Professor Smith is the only living representative of the first Faculty of Jefferson Medical College, and he yet recalls with great pleasure, the memory of his early efforts, in the interest of this institution. Long may he live to enjoy his well-won honors, and the affectionate regard of those who have the pleasure to know him.

On the resignation of Professor Smith, Dr. George McClellan accepted the responsibilities of the chair of Anatomy, in addition to

* Prof. Allan P. Smith, of the University of Maryland, informs the author that Prof. Pattison held the Chair of Surgery, but lectured chiefly upon Anatomy.

those of the chair of Surgery. This versatile, able, and energetic man, already loaded with the cares of a large surgical practice, filled these two laborious chairs, for three successive sessions of the College. At last finding the work too arduous, he appointed his brother Dr. Samuel McClellan, his Demonstrator of Anatomy in this school; the first one to fill that position, which the honorable Board of Trustees of the College more than confirmed, by making him Adjunct Professor, and in the following year full Professor of Anatomy; a post which he faithfully filled for two years. I had not the pleasure of a personal knowledge of Dr. George McClellan, but his great name has been a household word. He was so busy with his profession, so versatile in his tastes, and of so nervous a temperament, that he could not submit willingly to the drudgery of composition. The culminating work of his surgical career was his book on the practice of surgery, which was in process of publication at the time of his sudden death. This, and various occasional papers of great value, that he wrote for the medical journals of the day, are only some of the results of his practical experience, that we are able to gather. But this city, and even the country at large, are full of his storied history, and the splendor of many of his surgical achievements.

He died in the fifty-first year of his age, in the prime of his life, and in the full glow of his surgical reputation. I have obtained many facts of his biography, through the kindness of my valued friend Dr. A. H. Senseny of Chambersburg, Pennsylvania, one of his early pupils, and now one of the most distinguished practitioners in this State. In person Dr. George McClellan was of medium height, with a large symmetrical head, thick hair, and heavy eyebrows, a well-formed and somewhat projecting chin, high cheek bones, a deep set, quickly glancing, mild blue eye; with a firm compressed mouth, often illuminated with a manly smile, especially when any important surgical purpose was formed, or a difficult operation accomplished. Quick, nervous, restless, he had unusual steadiness of hand, sharp vision, and that instinctive concerted union of the hand and eye, so important to a surgeon. He was born at Woodstock, Connecticut, in 1796. His race was Highland Scotch. His American ancestor came from Kirkcudbright, on the Dee, and lived there at the eventful period which terminated the Scottish monarchy. His great-grandfather gallantly espoused the desperate cause of Charles Edward, fought in the disastrous battle of Culloden, and subsequently emigrated to this country, settling in Massachusetts. His immediate descendants became connected by marriage, with many of the older leading families of New

England, and were always distinguished by their energy, and intelligence.

They furnished one general officer, a patriot, in the war of the Revolution, and another of infinitely greater renown, who worthily filled a high sphere, in the more recent troubles of this country.

Dr. George McClellan graduated with the Degree of Bachelor of Arts, at Yale College, at the early age of eighteen. He came to this city, and was a private pupil of Dr. John Syng Dorsey, a nephew of the celebrated Dr. Physiek, the Father of American Surgery. He graduated in Medicine, at the University of Pennsylvania, in 1819, presenting a masterly thesis, on the ligation of arteries, which was subsequently deemed worthy of publication. After completing the usual term of service in the Philadelphia Hospital, he commenced the practice of his profession in this city. By knowledge of his profession, he was well qualified for success. This with his agreeable manners, vivacious temperament, and indomitable energy, soon gathered patients about the promising young surgeon. By his success in the management of his practice, he was soon enabled to achieve distinction. He began early, single handed, the career of a teacher in the branches of anatomy and surgery. From the number of students he attracted, he was soon obliged to abandon the small room, that he had selected for his humble beginning. He then associated with himself Dr. Eberle, a man eminent in his day for much and varied learning, who gave instruction in the practice of medicine, and on the subject of materia medica. They fitted up for these purposes larger rooms in the Apollodorian gallery, of the old Peale Museum of this city. Their popularity as lecturers was great, and the impression they made decided. Indeed, as one of his earlier pupils and his biographer has said, these lectures in the hall (named after Apollo, the god of Medicine), formed the germ of Jefferson Medical College. For at about this period, many who had the interests of our profession deeply at heart, perceived the necessity of creating another school of medicine, in order to accommodate the increasing flow of medical students, who sought this city as the source from which to derive medical instruction. Dr. McClellan threw himself with all his wonted ardor into this scheme, and the final result was, the establishment of the Medical Department of Jefferson College; an institution, which in the course of its varied career, has been the means of doubling the flow of medical students to this metropolis, and that apparently without the impairment of the interests, and certainly without any disparagement of the merits, of any other analogous institutions, established in this city. Thus, the officers of our college may feel a natural

pride, in having supplied over six thousand graduates in medicine to the country, and having at the present moment a larger number of living alumni than any other similar institution in the land.

Dr. McClellan early perceived the importance of attaching college clinics to the didactic course, in order that the students may see applied in practice, the doctrines taught from the several chairs. Indeed he may be considered, the founder of this supplemental means of instruction, now so generally practised in this country. This important feature in medical teaching, has been extended to almost its limit; and at this time forms as you know, one of the most attractive parts in the curriculum of our school.

Dr. McClellan, as you may well comprehend, was a remarkable man. His individuality was great, the whole cast of his mind different from the mass, and indicative of genius. As a man his conduct was independent, but frank and uncompromising. He was a brilliant meteor in the profession, a capital practical anatomist, and a surgeon, of a reputation unsurpassed by any of his time. We have no detailed biography of this distinguished man, a want which I trust may yet be supplied. We looked for such a production from his eldest son, Dr. John B. McClellan. This gentleman, beloved by all who knew him, an accomplished physician and surgeon, the inheritor of much of the talent of his father, has himself passed away, within a few weeks, to the land of shadows.

He leaves a son, a worthy alumnus of this college, who bears the name of his grandfather.

Dr. Samuel McClellan, as has already been mentioned, was appointed, at the instance of his brother, Adjunct Professor in 1829, and in 1830, made Professor of Anatomy in this Institution. Upon this branch, he lectured with faithfulness and ability, for three succeeding years. He then resigned this chair, as a matter of school policy, in favor of Professor Granville Sharpe Pattison, taking in its place that of obstetrics, together with *materia medica* and medical jurisprudence. In the former of these three branches, he attained to great celebrity as a practitioner.

He became disconnected with the school in 1839, and subsequently occupied himself mainly with the cares of his large practice, until his death, which occurred in 1854. He died, as he had lived, respected by all who knew him.

Dr. Samuel McClellan, a biographer writes, was a most excellent, quiet, unassuming man. He shrunk rather from, than sought the applause of the world. He was noted for his remarkable memory. His was a mind which grasped, never to forget, the most minute

details of his studies. Dr. Washington L. Atlee, in his very interesting and able address, given in this hall at the request of and before his fellow alumni, at the annual meeting of their association, observed that there was something very remarkable in the contrast between these two brothers.

"They were as unlike in mind and body, as day is from the night, or as the lion is from the lamb. Brothers! one was Jupiter Tonans riding on the whirlwind; the other Professor Samuel McClellan, gentle Zephyrus, basking in the sunshine."

Dr. Granville Sharpe Pattison, as has already been noted, succeeded Dr. Samuel McClellan as Professor of Anatomy in this institution, in 1831. Dr. Pattison was born in Glasgow, Scotland, in 1792.

At the age of seventeen he commenced the study of medicine at that city, in the office of Dr. Allan Burns, a celebrated and distinguished teacher of anatomy and surgery. At the age of nineteen, young Pattison had made such progress in his studies, that his preceptor appointed him his demonstrator of anatomy. This position he filled to the great satisfaction of his preceptor, until he reached his majority. He then began to teach anatomy independently, and was very successful in the undertaking. His naturally clear, calm, and logical Scotch mind, giving lucidity and strength, to the eloquence and fire which was even then conspicuous, made him a great teacher. He followed the plan of his master, giving much attention to the relative anatomy of parts; and always was complimented with large and admiring classes. In 1815 he received an appointment in the Anderson Institute, which he held for three years, when he came to this country, where he made his future home. He established himself in this city, and immediately commenced giving instruction in anatomy; maintaining his European reputation as a spirited and instructive teacher. In 1820, he was elected Professor in the University of Maryland, and removed to Baltimore. During his connection with that distinguished institution, it rose to a high degree of prosperity, and ranked in the number of its students, with the first schools in this country. Becoming unfitted for his professional duties by illness, he returned to his native country.

While on this visit, he received an appointment to the chair of anatomy in the University of London at its first organization.

With this institution he did not long remain connected. He soon returned to Philadelphia. In 1831, he was elected Professor of Anatomy in Jefferson Medical College, and during his connection with our Alma Mater, labored most faithfully in her behalf. He commenced the formation of an anatomical museum; he enlarged the anatomical

rooms, and introduced other measures, which added to the popularity of the school. In 1841 he resigned, and was elected to fill a similar professorship in the University of New York. He was the incumbent of that chair at his death, which took place in 1851, in the sixtieth year of his age. He lectured almost continuously for forty-one years, in Europe and America, upon the science that he loved, and to which he had devoted his life. Ten of the best years of his existence, he gave to our college.

As a lecturer, Dr. Pattison has rarely been excelled. He delivered his discourses with clearness, slightly and agreeably tinted with his native idiom, and, although affected with a slight tendency to lisp, in plain and dignified language; always leaving upon the minds of his hearers an impression so agreeable, that it seemed to rivet the lessons that he taught. His reputation is that of a man of genius, of deep pride and strong prejudices, but loving novelty and change. He was always the gentleman, and a courteous colleague.

The successor of Professor Pattison, and my immediate predecessor in this chair of general, descriptive, and surgical anatomy, was my father.

He had already for two years filled the chair of surgery in this institution. This he laid down voluntarily, to assume the duties of the position, made so influential over the fortune of the college, by the tact and brilliancy of Pattison. How well he has filled this important chair for the last four and thirty years, how much he has contributed to the growth and grandeur of the college, and how completely he has realized the *beau ideal* of an anatomical teacher, it becomes not me to speak: for mine are not the hands from which his eulogium should come; nor is this the proper time for it to be written, as he is yet among us, active, enthusiastic, strong, and able as ever. He will still give liberally to the medical students of this, and I trust of many succeeding years, of the abundance of his knowledge, and of his ripe experience. He will still serve in the surgical clinics of this college, where he has so long and so brilliantly labored; in conjunction with his old comrade in arms, and valued friend, our distinguished professor of surgery.

Gentlemen: In fulfilling the duties of my chair, to which I have been promoted by the honorable board of trustees of this college, I shall lay before you the great facts of anatomical science, as fully and as clearly as my humble abilities will permit. In the vast field that now opens before you, I will mark the route, direct your progress, and aid your exertions. Every inducement that should stimulate ambition, or animate your zeal, our science offers. I beg of you a favorable

hearing, as I urge you to co-operate, with my colleagues and myself, in our earnest endeavors to instruct you, in our respective departments. For myself I promise, in the discharge of the high duties of my chair, to fulfil them earnestly and faithfully. I have enjoyed some sixteen years of intercourse with medical students as an instructor, twelve of which have been passed as Demonstrator of Anatomy, in this school. I therefore well know the native, generous characteristics, of the student of medicine. I have several times received from them evidences of their esteem, far beyond my merit. I know that they will appreciate at least my efforts, to be of use to them. I feel assured of a patient hearing, and a generous audience, as I use my best exertions to explain the organization, which is that, not only of the cadaver, but what belongs as well to the living sentient beings, who are so soon to become your patients,

“ Beings, breathing thoughtful breath,
Travellers, betwixt life and death.”

With this exalted view of the science, ours is truly an august pursuit. Apply yourselves then diligently. Your earnest exertions, and ambitious aspirations, will, in the not very distant future, be crowned with a glorious success. Fame and honor will wait upon you; your valuable services will bring you grateful rewards to swell your resources, and better yet, the devotion of thankful hearts. Above all, you will enjoy that internal peace and happiness, which attend a useful life, well spent in the daily performance of good deeds. And now, gentlemen, in concluding; permit me to welcome you in the name of, and on behalf of the Trustees of the College and my brethren of the Faculty, to warmly welcome you, to the fostering care of this renowned institution.

